

Lesson 1



Feral pig

A Tale of Feral Pigs

This lesson introduces students to the concept of biomes. They begin the lesson by reading *California Connections: A Tale of Feral Pigs—Part 1*, which tells the story of the introduction of feral pigs to California and Australia. As an introduction to the idea that different organisms play the same role in different biomes, students identify and describe the unique characteristics of savanna and chaparral, the two different biomes where the pigs thrived.

By comparing and contrasting savanna and chaparral using a Venn diagram, students identify the location, climate, and dominant vegetation of these two biomes. Students also explore features—specifically climate and vegetation—that characterize

biomes and distinguish one biome from another. Students then define key vocabulary terms that will be used throughout the unit.

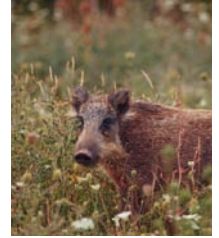
This lesson sets the stage for the remainder of the unit in which students will explore each of the

nine major biomes on Earth. In particular, the *A Tale of Feral Pigs—Part 1* story provides the context students will need in Lesson 5 to explore how human practices have influenced ecological roles similarly in two different biomes.

Learning Objective

Recognize different biomes.

Identify the characteristics of various biomes.



beings have influenced ecosystems throughout human history.

Islands are particularly vulnerable to ecological disruption as the result of introduced species. Non-native species in the United States have had negative effects on forests, lakes, and ponds. They have blocked waterways, affected human health, and replaced native species. Introduced species can have a significant economic cost; a 1993 report of the Congressional Office of Technology Assessment (OTA) estimated that introduced species cost taxpayers in the United States hundreds of millions to possibly billions of dollars each year.

Background

Chaparral is one of nine terrestrial biomes. It is found in specific coastal areas of most continents: the west coasts of North and South America; the Cape Town area of South Africa; the western tip of Australia; and the coastal areas of Europe, Asia, and Africa that surround the Mediterranean Sea. Evergreen shrubs (3 to 10 feet tall) with stiff branches and needles or leathery leaves dominate chaparral communities. These plant communities are usually very dense with few understory plants, although some stands are more open, and characterized by small, bushy trees.

Chaparral covers approximately 10 percent of California. Found in the foothills of both northern and

southern California mountains, chaparral is common on steep slopes that are too hot and dry to support oak woodland. Chaparral areas often experience large seasonal temperature fluctuations with high summer and mild winter temperatures.

Savanna is another terrestrial biome, found between tropical rainforests and desert in a wide band on either side of the equator. This biome occurs across northern Australia, southern India, Africa, and South America. A savanna consists of rolling grassland scattered with shrubs and trees. Savannas have warm temperatures year-round, with a dry winter season and a wet summer season.

Introducing species to environments where they do not occur naturally is one way in which human

Key Vocabulary

Biome: A group of similar ecosystems, such as tundra or desert that shares the similar types of vegetation and climate.

Chaparral: A biome containing shrubby plant communities including small evergreen trees and shrubs that are drought-resistant.

Feral: Describing an animal or population of animals that was once domesticated but are now wild.

Introduced species: A plant or animal that lives in an area outside its natural range as a result of human activity.

Omnivore: An organism that obtains energy and matter by eating both plants and animals.

Savanna: A tropical biome of grasslands and scattered trees.



Savanna

Toolbox



Summary of Activities

Students discover how non-native pigs were introduced into California and Australia and learn about similarities and differences in the two environments. They define the term “biome” and become familiar with the characteristics of biomes by comparing and contrasting savanna and chaparral.



Instructional Support

See Unit Resources, page 36

Prerequisite Knowledge



Students should be able to:

- use graphic organizers to take notes.
- define the term “omnivore” and describe the ecological role an omnivore fills in a food web.

Advanced Preparation

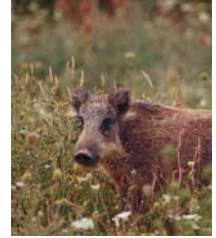


Gather and prepare Activity Masters.

Gather and prepare Materials Needed.

Gather and prepare Visual Aids:

- Prepare transparencies.
- Post the wall map of California’s Natural Regions.



Materials Needed



A-V equipment:

- Overhead or LCD projector, screen

Unit Dictionary:

- Provided separately

Visual Aids



Transparencies:

- Chaparral Biome Range Map, Visual Aid #1
- Savanna Biome Range Map, Visual Aid #2

Wall Maps:

- Natural Regions, provided separately

Duration



Preparation Time

30 min.

Instructional Time

50 min.



Safety Notes

None

Activity Masters in the Supporting Materials (SM)

Biomes Vocabulary Worksheet

SM, Pages 14–15
One per student

California Connections: A Tale of Feral Pigs—Part 1

SM, Pages 16–17
One per student

A Tale of Feral Pigs: California Timeline

SM, Page 18
One per student

A Tale of Feral Pigs: Australia Timeline

SM, Page 19
One per student

Chaparral and Savanna

SM, Page 20
One per student

Procedures

Vocabulary Development

Use the **Unit Dictionary** and the **Vocabulary Word Wall Cards** to introduce new words to students as appropriate. These documents are provided separately.

Step 1

Explain that in this unit, students will learn about the biomes of the world, ecological roles within these biomes, and the ways in which human practices influence these roles. Ask students to share with the class what they believe a biome to be. As needed, direct them toward the unit's definition of "biome"—a group of similar ecosystems such as tundra, desert, or grassland. Explain that biomes occur on a global scale and are larger than the ecosystems found on a local, regional, or state level.

Step 2

Distribute copies of the **Biomes Vocabulary Worksheet** (Lesson 1 Activity Master). Ask students to review the list and write in the definitions as best they can in the left column. (*Note: There are no right or wrong answers to the "My Definitions" column. Have students complete this to provide a sense of what they already know.*)

Step 3

Distribute copies of **California Connections: A Tale of Feral Pigs—Part 1** (Lesson 1 Activity Master), **A Tale of Feral Pigs: California Timeline** (Lesson 1 Activity Master), and **A Tale of Feral Pigs: Australia Timeline** (Lesson 1 Activity Master). Read Part I of the **California Connections** story aloud with the students, having them fill in their timelines as you read. Explain that students are to record the main events relating to the introduction of pigs and boars to the wild lands of California and Australia. They should also identify the general date of each event. (*Note: Stop frequently and have students share what they have written down to check that they are on the right track.*)

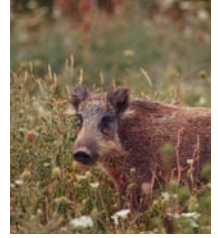
Step 4

When you reach the part in the story that describes California chaparral, review the definition of the word "biome" and point out the characteristics that generally identify a biome. (*Temperature, rainfall, types of plants and animals*) Project the transparency of the **Chaparral Biome Range Map** (Visual Aid #1). Have one student identify the regions of the world where chaparral is located. Ask students to describe the other areas of Earth where chaparral is found. (*The west coast of the United States, the west coast of South America, the Cape Town area of South Africa, the western tip of Australia, and the coastal areas of the Mediterranean*)

Have one or more students go to the wall map of California's **Natural Regions** and point to the locations where chaparral is found in California. Ask students to describe the areas where chaparral is found. (*Along the coast from southern California through the central coast.*)

Step 5

When you reach the part in the story that describes Australian savanna, project the **Savanna Biome Range Map** (Visual Aid #2). Ask one student to identify savanna in Australia on the map. Have students identify other areas on Earth where savanna is found. (*Northern Australia, southern India, Africa, and South America*)



Step 6

When you are finished reading, have students share their timelines and give them an opportunity to add any elements they might have missed.

Step 7

Distribute copies of **Chaparral and Savanna** (Lesson 1 Activity Master) and the **Unit Dictionary**. Ask students what kinds of characteristics define a particular biome. (*Temperature, rainfall, types of plants and animals*) Have students work individually or in pairs to complete **Chaparral and Savanna**, referring to the **California Connections** story and the **Unit Dictionary** as they work. They are to compare savanna and chaparral by listing characteristics unique to each biome and shared characteristics in the appropriate spaces on the diagram.

Step 8

In class, or as homework, ask students to use the **Unit Dictionary** to fill in the right-hand column of the **Biomes Vocabulary Worksheet**. They are to write correct definitions in their own words. Collect completed **Biomes Vocabulary Worksheets** for use in assessment.

Lesson Assessment

Description

This lesson teaches students that biomes are described by their climate and characteristic plant and animal life. The Venn diagrams students create in Step 7—**Chaparral and Savanna** (Lesson 1 Activity Master)—demonstrate whether they can identify and describe the characteristics of two biomes: chaparral and savanna. The definitions students provide in the right-hand column of **Biomes Vocabulary Worksheet** (Lesson 1 Activity Master) in Step 8 reveal whether they understand key vocabulary related to the lesson.

Suggested Scoring

Award one point for each characteristic listed on **Chaparral and Savanna**, up to a total of 10 points. For the **Biomes Vocabulary Worksheet**, award one point for each complete definition in the first column (whether correct or incorrect) and one point for each correct definition in the second column; students can earn a total of 12 points. Paraphrased versions of the **Unit Dictionary** definitions should receive full credit, as should abbreviated versions of the descriptions of savanna and chaparral. Student responses on **A Tale of Feral Pigs: California Timeline** (Lesson 1 Activity Master) and **A Tale of Feral Pigs: Australia Timeline** (Lesson 1 Activity Master) help students organize their thinking and are not graded.

Answer Key and Sample Answers

Biomes Vocabulary Worksheet

Lesson 1 Activity Master | page 1 of 2

Name: _____

Directions: These words may be new to you, but you may have an idea of what they mean. Write your own definition for each word in the column “My Definition.” Then, for homework, fill in the “Unit Dictionary Definition” column. Write the correct definition in your own words. You may use *A Tale of Feral Pigs* and your **Unit Dictionary** to help you.

Term	My Definition	Unit Dictionary Definition
Biome	_____	<i>A group of ecosystems with similar</i>
	_____	<i>climates and kinds of plants and</i>
	_____	<i>animals.</i>
	_____	_____
	_____	_____
Chaparral	_____	<i>Chaparral is one of the nine land</i>
	_____	<i>biomes. The climate is hot and dry in</i>
	_____	<i>summer. It is mild and rainy in winter.</i>
	_____	<i>The plants grow close together and</i>
	_____	<i>have small, tough leaves.</i>
Feral	_____	<i>Pets and livestock that escaped and</i>
	_____	<i>became wild.</i>
	_____	_____
	_____	_____
	_____	_____

Answer Key and Sample Answers

Biomes Vocabulary Worksheet

Lesson 1 Activity Master | page 2 of 2

Name: _____

Term	My Definition	Unit Dictionary Definition
Introduced species	_____	<i>A plant or animal brought to a new area</i>
	_____	<i>because of human activity.</i>
	_____	_____
	_____	_____
	_____	_____
Omnivore	_____	<i>An animal that eats both plants and</i>
	_____	<i>other animals.</i>
	_____	_____
	_____	_____
	_____	_____
Savanna	_____	<i>Savanna is one of the nine land biomes.</i>
	_____	<i>It is rolling grassland with some shrubs</i>
	_____	<i>and trees. There is one dry season and</i>
	_____	<i>one wet season. It is always warm.</i>
	_____	_____

Answer Key and Sample Answers

A Tale of Feral Pigs: California Timeline

Lesson 1 Activity Master

Name: _____

Directions: Complete the timeline with the information in the story *A Tale of Feral Pigs*.**What Happened?****When?***Spanish settlers brought European plants and animals to California, including pigs.**End of the 1700s**Wild boars brought from Germany to North Carolina.**1920s**Wild boars brought from North Carolina to California.**1920s**Pigs and boars escaped their fences and mixed their genes.**Late 1920s or soon after*Pigs living in the wild in California are *feral or introduced species*.Pigs and boars brought to California from Europe escaped into California's *chaparral* in the Coastal Mountain Range.

Answer Key and Sample Answers

A Tale of Feral Pigs: Australia Timeline

Lesson 1 Activity Master

Name: _____

Directions: Complete the timeline with the information in the story *A Tale of Feral Pigs*.

What Happened?

Settlers brought domestic pigs from England to Australia on the ships of the First Fleet.



Domestic pigs escaped from ranches in Northern Australia.



Feral pigs do very well in the Australian savanna.

When?

Late 1700s



Late 1700s or early 1800s



Late 1700s or early 1800s

As in California, feral pigs in Australia are _____ *omnivores* _____, which means they eat both plants and animals.

Pigs brought to northern Australia from Europe escaped into the _____ *savanna* _____, a good environment for feral pigs.

Answer Key and Sample Answers

Chaparral and Savanna

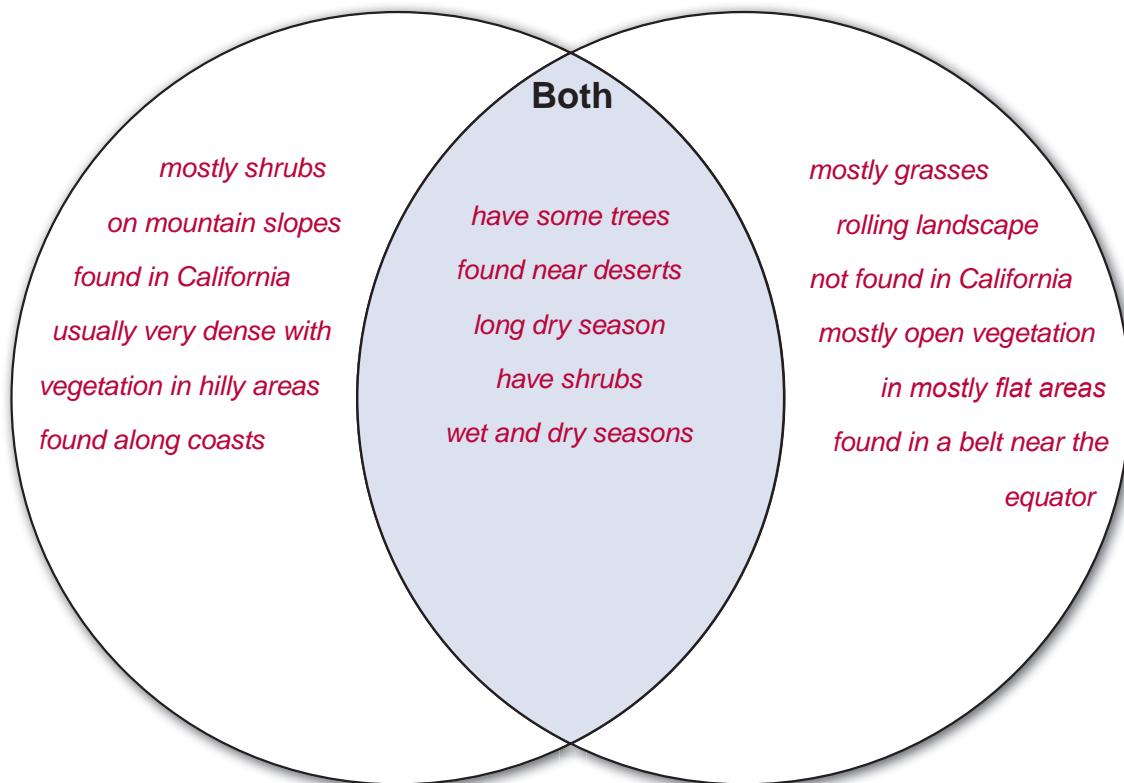
Lesson 1 Activity Master

Name: _____

Directions: Use *California Connections: A Tale of Feral Pigs—Part 1* and your **Unit Dictionary** to list features of the chaparral and savanna biomes. List at least two things that describe only chaparral in the left circle. List at least two things that describe only savanna in the right circle. List at least two things that are true for both biomes in the middle area where the circles overlap. Try to list 10 features.

Chaparral

Savanna



A Tale of Feral Pigs: Part I



By the end of the 1700s, Spanish settlers were bringing European plants and animals to their new farms and ranches in California. One of the animals they brought was the domestic European pig. Ranchers thought pigs would be good to bring because they cost very little to feed. Pigs are omnivores, they eat both plants and animals. California's ranchers had plenty of native oak trees on their properties.

Pigs loved the acorns that fell from the oak trees. The oaks provided free food for the ranchers' pigs, and the pigs were a cheap source of food for the ranchers' families. Eventually, some of the pigs pushed through their fences and enjoyed unlimited dining in the wild chaparral of the coastal mountain range. The escaped pigs joined together and ran in large packs.

More than 100 years later, in the 1920s, a business owner named George Gordon Moore brought several wild boars from Germany to North Carolina. He had a hunting preserve in the Smoky Mountains. His friends would come from all over the country to hunt the wild boars. "You can never tell whether [the boars] will run away from you or run at you," Moore said. He decided to bring some of the strongest boars to his ranch in Carmel, California. He wanted his friends to be able to hunt the wild animals year-round.

The boars, too, escaped. When they met the packs of escaped European pigs, their genes mixed with the pigs' genes and produced what



Feral pig

California Connections: A Tale of Feral Pigs: Part 1

Lesson 1 Activity Master | page 2 of 2



Australian Savanna

some people in California now see as a resource, and most see as a non-native pest: feral pigs. (“Feral” describes an animal that was once domesticated but is now wild.) Feral pigs have thick, bristly coats and cloven feet, similar to deer. They sometimes have a mane of rigid hair on their backs, with short, straight tails. Male feral pigs, also called boars, have tusks that are three-to-five inches long. Females are smaller and do not have tusks.

Halfway around the world, settlers brought domestic pigs from England to Australia.

They traveled in the late 1700s on the ships of the First Fleet. The First Fleet was a group of British ships that brought prisoners to Botany Bay, near what is now Sydney. These prisoners started the first European town in Australia. Some of the pigs that came with the Fleet escaped from Australian ranches, just as pigs had escaped in California. The feral pigs lived well in the wild savanna of northern Australia.

The chaparral and the savanna are both biological regions (biomes) that are especially good

places for feral pigs to live. Chaparral has many shrubs and scrub oak. It is found along California’s coast, on the slopes of Southern California’s mountains, and on the western foothills of the Sierra Nevada. In the Australian savanna, thick grasses and scattered trees grow. The weather is hot and dry in the summer and rainy and mild in the winter. Both biomes have dry seasons that can last for five to seven months. When the rainy season comes, many streams and rivers overflow their banks and erode the land.

1

Chaparral Biome Range Map

Visual Aid — Transparency

Chaparral Biome Range Map



2

Savanna Biome Range Map

Visual Aid — Transparency

Savanna Biome Range Map